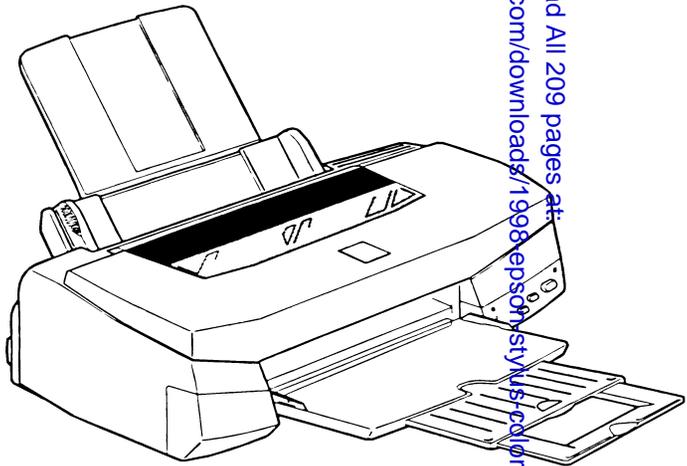


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Color ink jet printer
EPSON Stylus COLOR 440/640/740



EPSON[®]

TM-SC4/6/740

Product: 1998 EPSON Stylus Color 440/640/740 Terminal Printer Service Repair Workshop Manual
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PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, and maintenance and repair procedures of the Stylus COLOR 440, 640, and 740. The instructions and procedures included herein are intended for experienced repair technicians, and attention should be given to the precautions on the following pages.

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Revision	Date
1 st Release	November 1998

FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the printer.

FOR CANADIAN USERS

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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PRECAUTIONS

Precautionary notations throughout the text are categorized with respect to: (1) personal injury and (2) damage to equipment.



Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing a procedure preceded by a WARNING.



Signals a precaution which, if ignored, could result in damage to equipment.

Always observe the precautions listed below when performing repair and maintenance procedures.

WARNING

1. Always disconnect the product from both the power source and the host computer before performing any maintenance or repair procedure.
2. No work should be performed on the unit by persons unfamiliar with basic safety measures dictated for all electronics technicians in their line of work.
3. In performing testing described in this manual, do not connect the unit to a power source until instructed to do so. When the power supply cable must be connected, use extreme caution in working on the power supply and other electronic components.

CAUTION

1. Repairs on EPSON products should be performed only by an EPSON-certified repair technician.
2. Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different from the available power source, do not connect it to the power source.
3. Always verify that the EPSON product has been disconnected from the power source before removing or replacing printed circuit boards or individual chips.
4. To protect sensitive microprocessors and other circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
5. Replace malfunctioning components only with those components recommended by the manufacturer; introduction of second-source ICs or other nonapproved components may damage the product and void any applicable EPSON warranty.

Table of Contents

1. Product Description

Features	2
Specifications	4
Printing Specifications	4
Paper Specifications	8
Cut Sheets	8
Transparencies, Glossy Paper	9
Envelopes	9
Card Stock	9
Printable Area	10
Adjust Lever Setting (PG Adjust Lever)	12
Ink Cartridge Specifications	13
Environmental Conditions	15
Electrical Specifications	16
Reliability	16
Safety Approvals	16
CE Marking	16
Interface Specifications	17
Parallel Interface (Forward Channel)	17
Parallel Interface (Reverse Channel)	19
Host Data Transfer Timeout Prevention	22
Interface Selection	22
Serial Interface (Stylus COLOR 740 only)	23
USB Interface (Stylus COLOR 740 only)	23
Control Panel	24
Indicators (LEDs)	24
Control Panel Functions	25
LED Indicators and Printer States	26

Error Conditions	27
Ink Out	27
Paper Out	27
Paper Jam	27
No Ink Cartridge	28
Maintenance Request	28
Fatal Errors	28
Printer Initialization	29
Initialization Settings	29
Main Components	30
Printer Mechanism	30
C206 MAIN-B Board (Stylus COLOR 440)	31
C256 MAIN Board (Stylus COLOR 640)	31
C257 MAIN Board (Stylus COLOR 740)	32
Power Supply Board	
C206 PSB/PSE (Stylus COLOR 440 and 640)	
C257 PSB/PSE (Stylus COLOR 740)	32
C206 PNL Board (Stylus COLOR 440 and 640)	33
C209 PNL Board (Stylus COLOR 740)	33

2. Operating Principles

Printer Mechanism	35
Printhead	36
Printing Process	36
Carriage Mechanism	38
Platen Gap and Parallelism Adjustment Mechanisms	39
Carriage Lock Mechanism	40
Paper Feed Motor	40
Paper Handling	41
ASF transmission	41
Automatic Sheet Feeder (ASF)	42
Paper Feed Mechanism	43
Ink System	43

Head Cleaning Operations	44
Pump Mechanism	45
Capping Mechanism	47
Electronic Circuit Boards.	48
Power Supply Board	49
Power Supply Operation	49
Main Circuit Board	51
CPU	54
Gate Array	54
EEPROM	55
Reset Circuit	56
Power-Off Timer Circuit	58
Sensor Circuits	59
Printhead Driver	60
Paper Feed (PF) Motor Driver	63
Carriage (CR) Motor Drive Circuit	64

3. Troubleshooting

Troubleshooting	68
Component Test Specifications	68
Unit Level Troubleshooting	71
Printer Does Not Turn On	71
Error Indicated by LEDs	72
Printing Failure	72
Paper Not Feeding Correctly	73
Control Panel Operation is Abnormal	73
Unit Repair of the Power Supply Board	74
Unit Repair of the Main Board	77
Repair of the Printer Mechanism	82

4. Disassembly and Assembly

Overview	86
Precautions for Disassembling the Printer	86
Tools	87
Specification for Screws	88
Service Checklist	89
Disassembly Procedures	90
Removing the Housing	91
Removing the Board Assembly	92
Removing the Front Panels	94
Disassembling the Printer Mechanism	95
Removing the Printhead	95
Removing the Waste Ink Pad Assembly	98
Removing the Pump and Capping Assemblies	99
Removing the CR Motor	102
Removing the PF Motor	103
Removing the ASF Assembly	105
Removing the Carriage Assembly	109
Removing the Paper Feed and Paper Eject Roller Assemblies	111
Removing the PE Sensor	113
Removing the HP Sensor	114

5. Adjustments

Overview	116
Adjustment Tools Required	117
Choosing the Correct Adjustment Program	117
Adjustments	118
Parallelism Adjustment	118
Using the Adjustment Program	120
Operating Environment	120
Starting the Adjustment Program	120

Entering the Main Menu	121
Initial Ink Charge	125
Head Cleaning Operation	126
Protection Counter	127
Market Destination Check	129
Head Voltage ID Input	131
Head Angle Adjustment	133
Bi-D Adjustment	136
Printing the A4 Check Pattern	138

6. Maintenance

Cleaning	140
Corrective Maintenance	140
Printhead Cleaning	140
Maintenance Request	140
Lubrication	141

7. Appendix

Connector Summary (Stylus COLOR 440 and 640)	147
Connector Summary (Stylus COLOR 740)	151
EEPROM Address Map (Stylus COLOR 440 and 640)	155
EEPROM Address Map (Stylus COLOR 740)	159
Circuit Board Component Layouts	164
Exploded Diagrams	174

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The EPSON Stylus COLOR 440/640/740 printers are high-performance, low-cost printers designed for the small office/home office (SOHO) market. The Stylus COLOR 440 has the same print quality (720 × 720 dpi) as the Stylus ProXL; the Stylus COLOR 640 and Stylus COLOR 740 have the same print quality (1440 × 720) as the Stylus COLOR 600 and Stylus COLOR 800.

The main features of these printers are:

- High-quality color printing
 - High resolution:
 - Stylus COLOR 440—720 (H) x 720 (V) dpi
 - Stylus COLOR 640—1440 (H) X 720 (V) dpi
 - Stylus COLOR 740—1440 (H) X 720 (V) dpi
 - Standard four-color printing (cyan, magenta, yellow, and black)
 - Stylus COLOR 440—Black: 64 nozzles; CMY: 21 nozzles
 - Stylus COLOR 640: Black: 64 nozzles; CMY: 32 nozzles
 - Stylus COLOR 740: Black: 144 nozzles; CMY: 48 nozzles
 - Traditional printing and new Microweave printing that eliminates banding
- Built-in auto sheet feeder
 - Holds 100 cut-sheets (55 g/m²)
 - Holds 10 envelopes
 - Holds 10 transparencies
 - Holds 65 sheets of special paper
- High-speed printing
 - Stylus COLOR 440: 200 cps at 10 cpi
 - Stylus COLOR 640: 200 cps in Normal mode, 400 cps in Draft mode
 - Stylus COLOR 740: 200 cps
- The printer's head drive frequency, 14.4 KHz, allows printing that is twice as fast as that of the Stylus COLOR (true of all three models).
- Compact size
 - Stylus COLOR 440: 16.9" (429 mm) W x 9" (231 mm) D x 6.1" (155 mm) H
 - Stylus COLOR 640: 16.9" (429 mm) W x 9" (231 mm) D x 6.2" (157 mm) H
 - Stylus COLOR 740: 16.9" (429 mm) W x 10.3" (261 mm) D x 6.2" (157 mm) H
- Light-weight
 - Weight: 11.5 lbs. (5.2 Kg)
- Acoustic noise
 - Stylus COLOR 440: Approximately 45 dB
 - Stylus COLOR 640: Approximately 47 dB
 - Stylus COLOR 740: Approximately 47 dB
- One combined printhead for black and color
- Bidirectional parallel interface (IEEE-1284 level 1 device) for all three models
- Additional interfaces:
 - Stylus COLOR 740: USB
- Operating environments:
 - Stylus COLOR 440 and 640: Windows only
 - Stylus COLOR 740: Windows and Macintosh

- Fonts:
 - All three models: Standard and NLSP
 - Stylus COLOR 740: 5 scalable fonts

Table 1-1. Consumables Available for Stylus Color 440/640/740

Items	Codes	Remarks
Black ink cartridge	S020189	Stylus Color 740
Black ink cartridge	S020187	Stylus Color 440, 640
CMY ink cartridge	S020191	Stylus Color 440, 640, 740
EPSON 360 dpi ink jet paper	S041025	Size: A4 (200 sheets)
EPSON 360 dpi ink jet paper	S041059	Size: A4 (100 sheets)
EPSON 360 dpi ink jet paper	S041060	Size: Letter (100 sheets)
Photo quality ink jet paper	S041026	Size: A4 (200 sheets)
Photo quality ink jet paper	S041061	Size: A4 (100 sheets)
Photo quality ink jet paper	S041062	Size: Letter
Photo quality ink jet paper	S041067	Size: Legal
Photo quality glossy paper (new release)	S041126	Size: A4
Photo quality glossy paper (new release)	S041124	Size: Letter
Photo quality glossy film	S041071	Size: A4
Photo quality glossy film	S041124	Size: Letter
Photo quality glossy film	S041107	Size: A6
Ink jet transparencies	S041063	Size: A4
Ink jet transparencies	S041064	Size: Letter
Photo quality ink jet cards	S041054	Size: A6
Photo quality ink jet cards	S041121	Size: 5 x 8 inches
Photo quality ink jet cards	S041122	Size: 8 x 10 inches
Photo quality self-adhesive sheets	S041106	Size: A4

1.2 Specifications

This section provides the following information for all three printers: printing specifications, paper specifications, printable area, adjust lever settings, ink cartridge specifications, environmental conditions, electric specifications, reliability statistics, safety approvals, and CE marking.

1.2.1 Printing Specifications

- Print method
 - On-demand ink jet (MACH type; one unit combining black and color heads)
- Print direction
 - Bidirectional with logic seeking
- Print speed/Printable columns

- Nozzle Configurations:
 - Stylus COLOR 440 (see [Figure 1-1](#)):
 - Black— 64 nozzles
 - Color—21 nozzles × 3 (CMY)
 - Stylus COLOR 640 (see [Figure 1-2](#)):
 - Black— 64 nozzles
 - Color—32 nozzles × 3 (CMY)
 - Stylus COLOR 740 (see [Figure 1-3](#)):
 - Black— 144 nozzles
 - Color—48 nozzles × 3 (CMY)

Table 1-2. Character Mode Speed

Model Name	Character Pitch	Printable Columns	LQ Speed	Draft Speed
Stylus COLOR 440	10	80	200 CPS	—
Stylus COLOR 640	10	80	200 CPS	400 CPS
Stylus COLOR 740	10	80	200 CPS	—

Table 1-3. Graphic Mode Speed

Horizontal Resolution	Printable Area	Available dots	CR Speed
180 dpi	8.26	1488	20 IPS
360 dpi	8.26	2976	20 IPS
720 dpi	8.26	5952	20 IPS

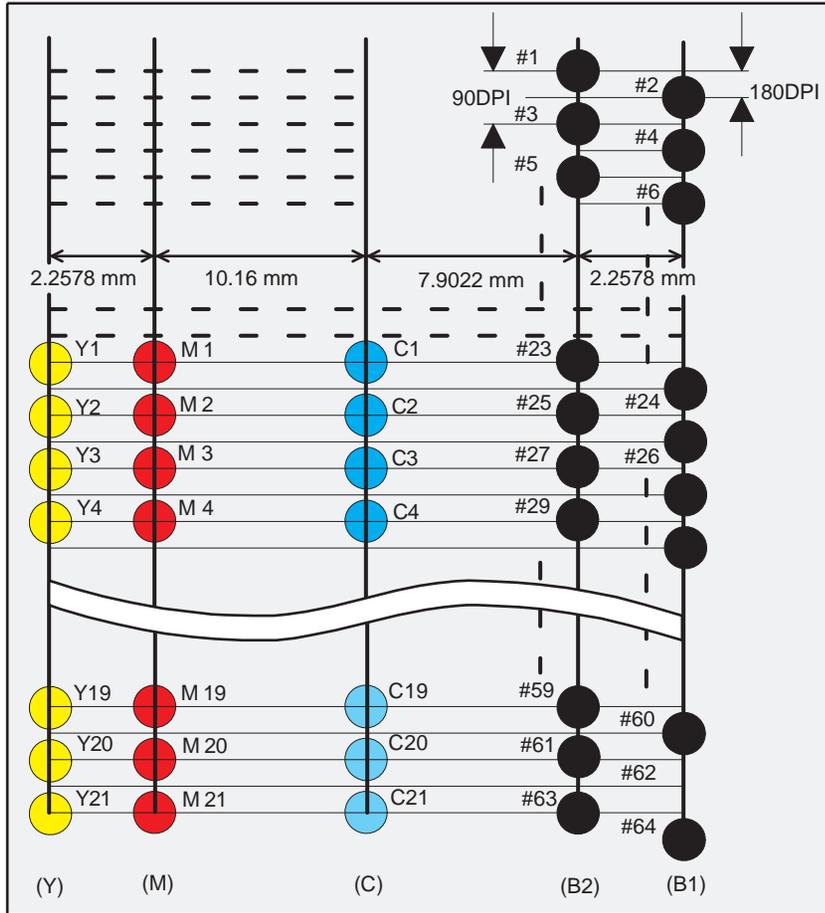


Figure 1-1. Nozzle Configuration for the Stylus COLOR 440

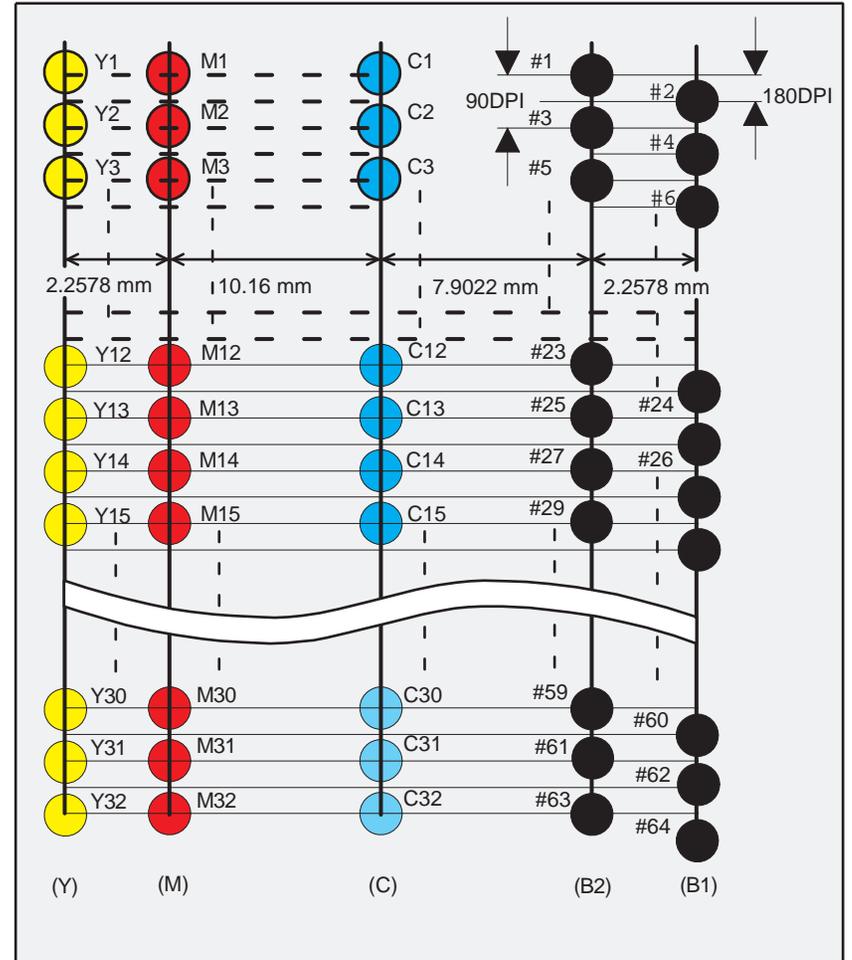


Figure 1-2. Nozzle Configuration for the Stylus COLOR 640

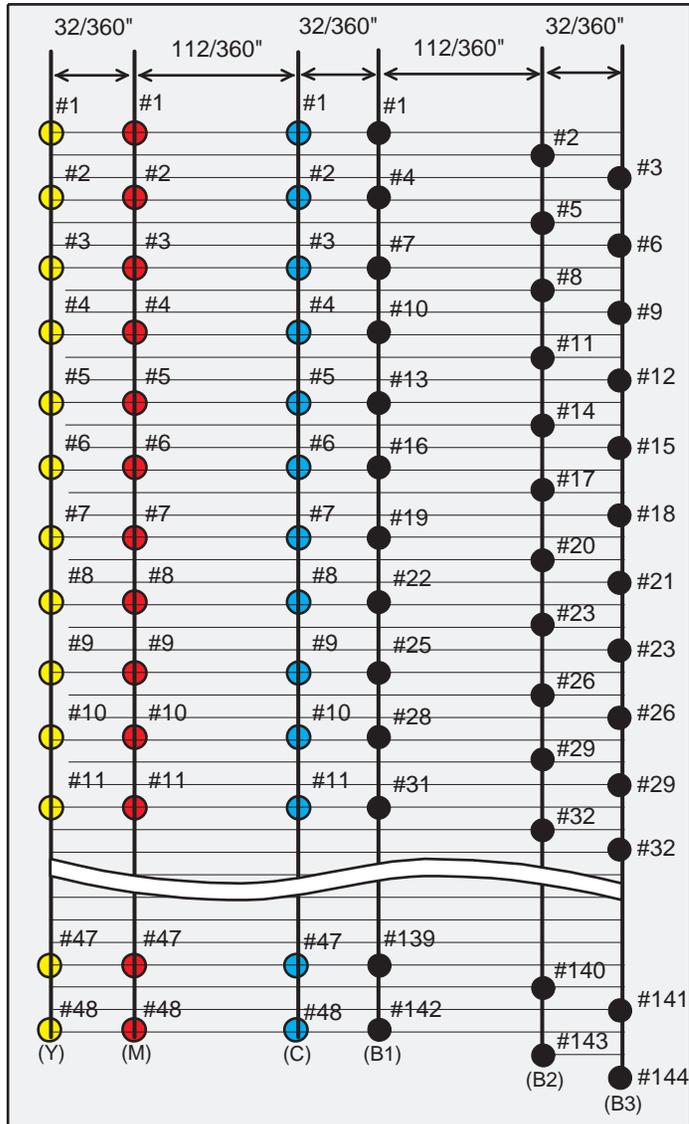


Figure 1-3. Nozzle Configuration for the Stylus COLOR 740

- Feed method
 - Friction feed with the ASF (Automatic Sheet Feeder)
- Line spacing
 - Stylus COLOR 440: 1/6 inch, or programmable in units of 1/360 inch
 - Stylus COLOR 640: 1/6 inch, or programmable in units of 1/360 inch
 - Stylus COLOR 740: 1/6 inch, or programmable in units of 1/360 inch
- Paper path
 - Cut-sheets: ASF (top entry)
- Feed speed
 - Stylus COLOR 440 and 640:
190 ms per 1/3-inch (8.5-mm) increment advance
2.0 in/sec (50.8 mm/sec), continuous
 - Stylus COLOR 740
110 ms, advancing in 0.4-inch (10.16-mm) increments
4.5 in/sec (114.3 mm/sec), continuous
- Ink supply
 - Ink cartridges (Black and CMY)
- Input data buffer
 - Stylus COLOR 440: 10 Kb
 - Stylus COLOR 640: 32 Kb
 - Stylus COLOR 740: 64 Kb

- Paper capacity of input tray
 - Size: Index card to Legal
 - Thickness: Less than 8 mm
 - Paper capacity: 100 cut sheets
10 envelopes
65 sheets of coated paper (360 dpi)
65 sheets of coated paper (720 dpi)
20 glossy sheets or sheets of EPSON Photo Paper
30 transparency sheets
30 index cards
1 sheet of any of the following: Panoramic Photo Paper, Iron-On Cool Peel Transfer Paper, Photo Stickers, Glossy Film, Self Adhesive Paper

□ Character tables:

- Stylus COLOR 440 and 640
 - PC437 (US, Standard Europe)
 - PC850 (Multilingual)

NOTE: *These character sets are not available for selection in the default setting mode.*

■ Stylus COLOR 740

- Standard version: 11 character tables
Italic, PC437 (US Standard, Europe), PC850 (Multilingual), PC860 (Portuguese), PC861 (Icelandic), PC863 (Canadian-French), PC865 (Nordic), Abicomp, BRASCII, Roman 8, ISO Latin 1
- NLSP version: 30 character tables
Italic, PC437, PC437 Greek, PC850, PC852, PC853, PC855, PC857, PC860, PC861, PC865, PC866, ISO8859-7, ISO Latin 1T, PC774, Estonia, ISO8859-2, PC866-LAT, PC866UKR, PC AR864, PC APTEC, PC708, PC720, Hebrew7*, Hebrew8*, PC862*

NOTE: *Character tables marked with an asterisk are not available for selection in the default setting mode.*

□ Typefaces

■ Stylus COLOR 440 and 640

Bitmap LQ font: EPSON Courier 10 cpi

■ Stylus COLOR 740

□ Bitmap LQ fonts:

EPSON Roman	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Sans Serif	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Courier	10 cpi, 12 cpi, 15 cpi
EPSON Prestige	10 cpi, 12 cpi, 15 cpi
EPSON Script	10 cpi, 12 cpi, 15 cpi

□ Scalable fonts:

EPSON Roman	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Sans Serif	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Roman T	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Sans Serif H	10.5 pt.; 8 to 32 pt. (2 pt. increments)

NOTE: Each typeface has 4 variations: Normal, Bold, Italic, and Bold Italic.

□ Control codes

■ Stylus COLOR 440 and 640

ESC/P raster
EPSON remote commands

■ Stylus COLOR 740

ESC/P2 and ESC/P raster
EPSON remote commands

1.2.2 Paper Specifications

This section describes the printable area and types of paper that can be used with these printers.

1.2.2.1 Cut Sheets

Sizes

Letter:	Width 8.5" (216 mm) x Length 11.0" (279 mm)
Legal:	Width 8.5" (216 mm) x Length 14.0" (356 mm)
Statement:	Width 5.5" (139.7 mm) x Length 8.5" (216 mm)
Exclusive:	Width 7.5" (190.5 mm) x Length 10" (254 mm)
A4:	Width 8.3" (210 mm) x Length 11.7" (297 mm)
B5:	Width 7.2" (182 mm) x Length 10.1" (257 mm)

Thickness

0.003" (0.08 mm) to 0.004" (0.11 mm)

Weight

17 lb (64 g/m²) to 24 lb (90 g/m²)

Quality

EPSON paper, bond paper, or PPC

1.2.2.2 Transparencies, Glossy Paper

Sizes

Letter: Width 8.5" (216 mm) x Length 11.0" (279 mm)
A4: Width 8.3" (210 mm) x Length 11.7" (297 mm)

Thickness

0.003" (0.075 mm) to 0.0033" (0.085 mm)

NOTE: *Printing on transparencies is available only at normal temperatures.*

1.2.2.3 Envelopes

Sizes

No.10 Width 9.5" (241 mm) x Length 4.13" (104.88 mm)
DL Width 8.7" (220 mm) x Length 4.3" (110 mm)
C6 Width 6.4" (162 mm) x Length 4.5" (114 mm)

Thickness

0.006" (0.16 mm) to 0.02" (0.52 mm)

Weight

12 lb (45 g/m²) to 20 lb (75 g/m²)

Quality or Paper Type

Bond paper envelopes, plain paper envelopes, or air mail envelopes

NOTES:

1. *Printing on envelopes is available only at normal temperatures.*
2. *Load the longer side of the envelope horizontally.*

1.2.2.4 Card Stock

Sizes

5 x 8" card: Width 5.0" (127 mm) x Length 8.0" (203 mm)
8 x 10" card: Width 8.0" (203 mm) x Length 10.0" (254 mm)
A6 card: Width 4.1" (105 mm) x Length 5.8" (148 mm)
A5 card: Width 5.8" (148 mm) x Length 8.3" (210 mm)

Thickness

Less than 0.0091" (0.23 mm)

1.2.3 Printable Area

Cut Sheets

Figure 1-4 in the right column and the tables on the following page show printable areas in character mode and raster graphics mode.

NOTE: Character mode is supported only by the Stylus COLOR 740.

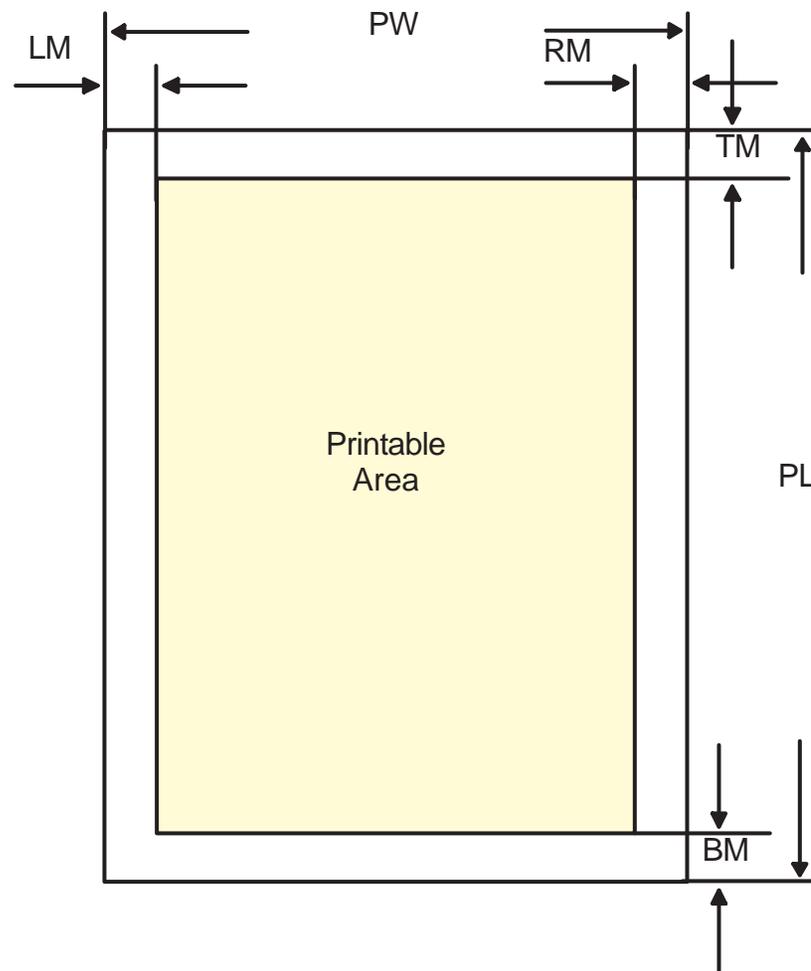


Figure 1-4. Printable Area for Cut Sheets

Table 1-4. Raster Graphics Mode

Paper Size	PW (Typical Paper Width)	PL (Typical Paper Length)	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin)	BM (Minimum Bottom Margin)
A4	8.3" (210 mm)	11.7" (297 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Letter	8.5" (216 mm)	11.0" (279 mm)	0.12" (3 mm)	0.35" (9 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
B5	7.2" (182 mm)	10.1" (257 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Legal	8.5" (216 mm)	14.0" (356 mm)	0.12" (3 mm)	0.35" (9 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Statement	5.5" (139.7 mm)	8.5" (216 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Executive	7.5" (190.5 mm)	10" (254 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)

Table 1-5. Character Mode (Stylus COLOR 740 only)

Paper Size	PW (Typical Paper Width)	PL (Typical Paper Length)	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin)	BM (Minimum Bottom Margin)
A4	8.3" (210 mm)	11.7" (297 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Letter	8.5" (216 mm)	11.0" (279 mm)	0.12" (3 mm)	0.35" (9 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
B5	7.2" (182 mm)	10.1" (257 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Legal	8.5" (216 mm)	14.0" (356 mm)	0.12" (3 mm)	0.35" (9 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Statement	5.5" (139.7 mm)	8.5" (216 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
Executive	7.5" (190.5 mm)	10" (254 mm)	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)

Envelopes

Table 1-6 and Figure 1-5 show the printable area for envelopes.

Table 1-6. Printable Area for Envelopes

Envelope Size	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin)	BM (Minimum Bottom Margin)
#10	0.12" (3 mm)	1.10" (28 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
DL	0.12" (3 mm)	0.28" (7 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)
C6	0.12" (3 mm)	0.12" (3 mm)	0.12" (3 mm)	0.54" (14 mm) 0.12" (3 mm)

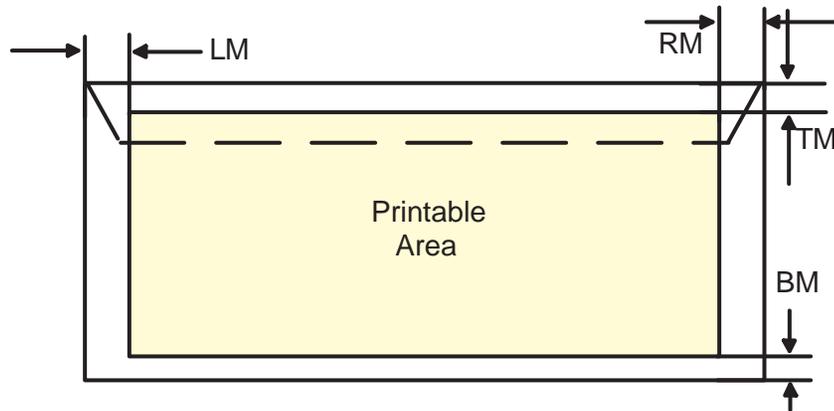


Figure 1-5. Printable Area for Envelopes

1.2.3.1 Adjust Lever Setting (PG Adjust Lever)

The adjust lever (blue) on the right side under the printer cover needs to be set to the proper position for the paper you print on. (See Table 1-7.) If you find that the paper wrinkles during printing, or if smudges appear on the paper, move the lever to the + position (toward the rear), regardless of paper type.

Table 1-7. Adjust Lever Setting

Lever Position	Clearance between head and platen
Plus position	1.04 mm
Zero position	1.74 mm (+0.7 mm)

NOTE: Always return the adjust lever to the zero position after you finish printing. Leaving the lever in the plus position may cause poor printing in the next printout.

1.2.4 Ink Cartridge Specifications

Black Ink Cartridge

Table 1-8. Black Ink Cartridge Specifications

Items	Specifications
Type	Exclusive EPSON ink cartridges designed for the Stylus COLOR 440, 640, and 740
Print capacity	<ul style="list-style-type: none"> Stylus COLOR 440 and 640 <ul style="list-style-type: none"> -540 pages / letter or A4 (ISO/IEC 10561 Letter Pattern at 360 dpi) Stylus COLOR 740 <ul style="list-style-type: none"> - 900 pages / letter or A4 (ISO/IEC 10561 Letter Pattern at 360 dpi)
Cartridge life	2 years (sealed in package) / 6 months (out of package)
Environmental conditions	<ul style="list-style-type: none"> Temperature <ul style="list-style-type: none"> - Storage: -4 to 104 °F (-20 to 40 °C) 1 month at 104 °F (40 °C) - Packing storage: -22 to 104 °F (-30 to 40 °C) 1 month at 104 °F (40 °C) - Transit: -22 to 140 °F (-30 to 60 °C) 1 month at 104 °F (40 °C) 120 hours at 140 °F (60 °C) Humidity <ul style="list-style-type: none"> 5% to 85% (without condensation) <p>Note: Ink freezes below 27 °F (-3 °C) but it thaws and is usable after 3 hours at 77 °F (25 °C).</p>
Dimensions	<ul style="list-style-type: none"> Stylus COLOR 440 and 640 0.78" W × 2.1" D × 1.52" H (19.8 mm W × 52.7 mm D × 38.5 mm H) Stylus COLOR 740 1.09" W × 2.1" D × 1.5" H (27.8 mm W × 52.7 mm D × 38.5 mm H)
Weight	Cartridge plus ink: 1.06 oz (30 g) Total ink: 0.58 oz +/- 0.02 oz (16.4 +/-0.5 g) Consumable ink weight: more than 0.43 oz (12.1 g)

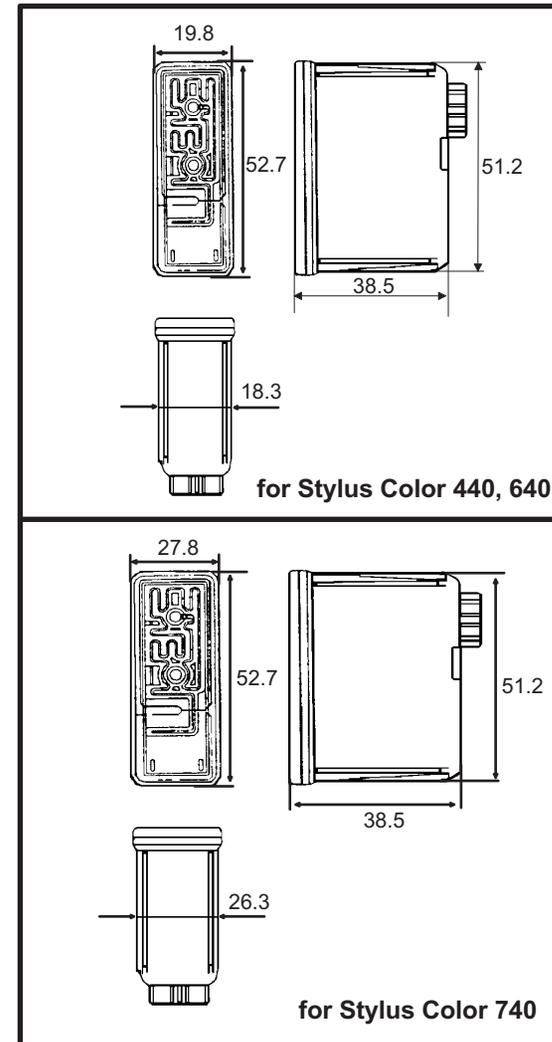


Figure 1-6. Black Ink Cartridge Dimensions (units in mm)

Color Ink Cartridge

Table 1-9. Color Ink Cartridge Specifications

Items	Specifications
Type	Cartridge especially designed for the Stylus COLOR 440, 640 and 740
Colors	Cyan, Magenta, Yellow (CMY)
Print capacity	300 pages / A4 (360 dpi, 5% duty each color)
Cartridge life	2 years (sealed in package) / 6 months (out of package)
Environmental conditions	<ul style="list-style-type: none"> Temperature <ul style="list-style-type: none"> - Storage: -4 to 104 °F (-20 to 40 °C) 1 month at 104 °F (40 °C) - Packing storage: -22 to 104 °F (-30 °C to 40 °C) 1 month at 104 °F (40 °C) - Transit: -22 to 140 °F (-30 °C to 60 °C) 1 month at 104 °F (40 °C) 120 hours at 140 °F (60 °C) Humidity 5% to 85% (without condensation) <p>Note: Ink freezes below 27 °F (-3 °C), but it thaws and is usable after 3 hours at 77 °F (25 °C).</p> <ul style="list-style-type: none"> Dimensions 1.7" W × 2.1" D × 1.5" H (42.9 mm W × 52.7 mm D × 38.5 mm H)
Weight	Cartridge plus ink: 2.36 oz (67 g) Total ink: 0.45 oz +/- 0.02 oz (12.8 +/-0.5 g) Consumable ink weight: more than 0.34 oz (9.6 g)

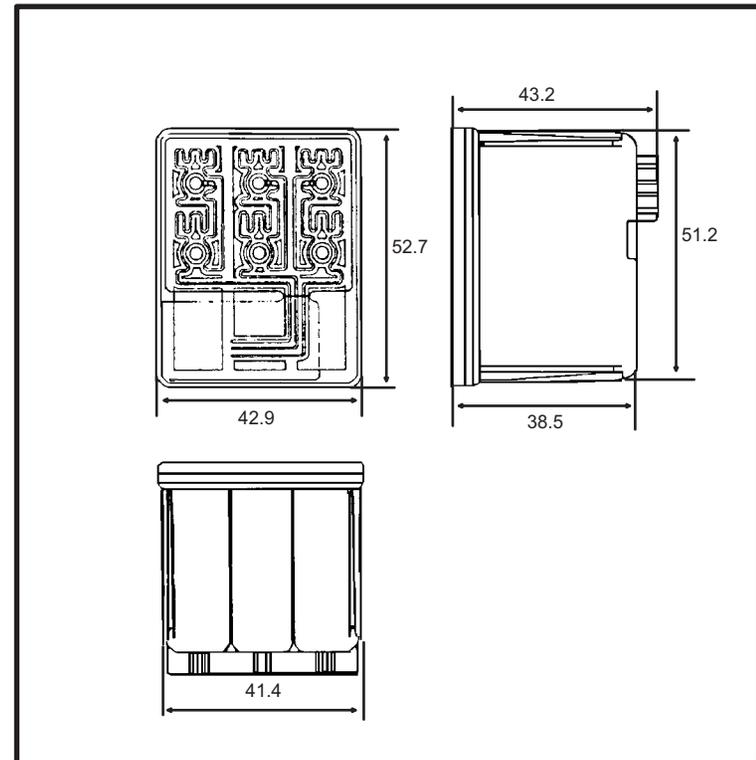


Figure 1-7. Color Ink Cartridge Dimensions (units in mm)

1.2.5 Environmental Conditions

☐ Temperature

- Operating : 50 to 95 °F (10 to 35 °C) (See Figure 1-8.)
- Non-operating: -4 °F to 140 °F (-20 to 60 °C) in shipment container

NOTE: 1 month at 104 °F (40 °C) and 120 hours at 140 °F (60 °C)

☐ Humidity

- Operating: 20% to 80% RH without condensation (See Figure 1-8.)
- Non-operating: 5% to 85% RH without condensation and in shipping container

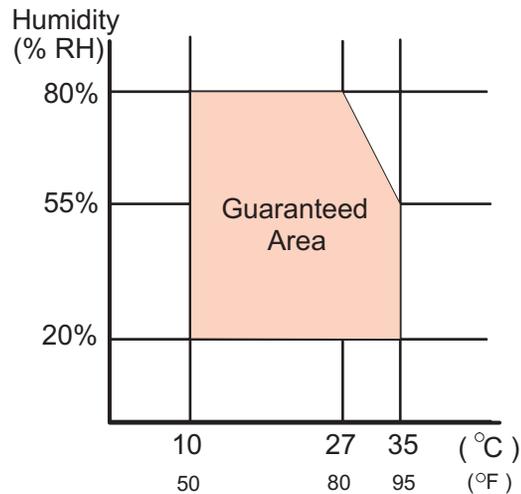


Figure 1-8. Temperature / Humidity of Range

☐ Resistance to shock

- Operating: 1 G, within 1 ms
X, Y, and Z directions
- Non-operating: 2 G, within 2 ms
X, Y, and Z directions, in shipment container

☐ Resistance to vibration

- Operating: 0.15 G
- Non-operating: 0.50 G

- NOTES:**
1. When the printer is not in operation, make sure that the printhead is capped.
 2. During transport, make sure the printhead is capped and the ink cartridges are installed.
 3. If you notice that the printhead is not capped while power is off, turn power on (ink cartridges should be installed). After the printhead has moved to the capping position, turn power off again.
 4. Ink freezes under 27 °F (-3 °C), but thaws and becomes usable again after 3 hours at 77 °F (25 °C).

1.2.6 Electrical Specifications

120 V Version

Rated voltage:	120 VAC
Input voltage range:	99 to 132 VAC
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	0.4 A (maximum 0.5 A)
Power consumption:	Approximately 16 W (ISO/IEC 10561 Letter pattern); ENERGY STAR-compliant
Insulation resistance:	10M ohms minimum (between AC line and chassis, 500 VDC)
Dielectric strength:	1000 VAC rms for 1 minute or 1200 VAC rms for 1 second (between AC line and chassis)

220 to 240V Version

Rated voltage:	220 to 240 VAC
Input voltage range:	198 to 264 VAC
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	0.2 A (maximum 0.3 A)
Power consumption:	Approximately 16 W (ISO/IEC 10561 Letter pattern); ENERGY STAR-compliant
Insulation resistance:	10M ohms minimum (500 VDC between AC line and chassis)
Dielectric strength:	1500 VAC rms for 1 minute (between AC line and chassis)

1.2.7 Reliability

Total Print Volume

Stylus COLOR 440:	10,000 pages (A4, Letter)
Stylus COLOR 640:	25,000 pages (A4, Letter)
Stylus COLOR 740:	75,000 pages (A4, Letter)

Printhead Life

Stylus COLOR 440:	2x109 dots/nozzle
Stylus COLOR 640:	2x109 dots/nozzle
Stylus COLOR 740:	4x109 dots/nozzle

1.2.8 Safety Approvals

120 V Version

Safety standards	UL1950 with D3 CSA22.2 No.950 with D3
EMI	FCC part 15 subpart B class B CSA C108.8 class B

220 to 240 V Version

Safety standards	EN 60950 (VDE, NEMKO)
EMI	EN55022 (CISPR Pub.22) class B AS/NZS 3548 class B

1.2.9 CE Marking

220 to 240 V Version

Low Voltage Directive 73/23/EEC:	EN60950
EMC Directive 89/336/EEC:	EN55022 Class B EN61000-3-2 EN61000-3-3 EN50082-1 IEC801-2 IEC801-3 IEC801-4

1.3 Interface Specifications

A parallel interface is standard on all three printers.

1.3.1 Parallel Interface (Forward Channel)

Transmission mode	8-bit parallel, IEEE-1284 compatibility mode
Synchronization	STROBE pulse
Handshaking	BUSY and $\overline{\text{ACKLG}}$ signals
Signal level	TTL-compatible level
Adaptable connector	57-30360 (Amphenol) or equivalent

The BUSY signal is set high before setting either $\overline{\text{ERROR}}$ low or PE high, and remains high until these signals return to their inactive state.

The BUSY signal is HIGH at these times:

- During data entry
- When the input data buffer is full
- When the $\overline{\text{INIT}}$ signal is LOW, or during hardware initialization
- When there is a printer error (See $\overline{\text{ERROR}}$ signal)

The $\overline{\text{ERROR}}$ signal is LOW when the printer is in one of the following states.

- Printer hardware error (fatal error)
- Paper-out error
- Paper-jam error
- Ink-out error

The PE signal is HIGH during a paper-out error.

Table 1-10 on the following page shows the signal and connector pin assignments for the parallel interface. With these signals, a twisted pair line is used and the return side is connected to the GND signal.

NOTE: The forward channel is the mode used to send ordinary data, such as when a print command is sent from the computer to the printer.

Table 1-10. Signal and Connector Pin Assignments for the Parallel Interface

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	$\overline{\text{STROBE}}$	19	In	The strobe pulse. Data is read in at the falling edge of this pulse.
2 to 9	DATA0 to DATA7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at a HIGH level when data is logical 1, and at a LOW level when data is logical 0.
10	$\overline{\text{ACKNLG}}$	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A HIGH signal indicates that the printer cannot receive data.
12	PE	28	Out	A HIGH signal indicates a paper-out error.
13	SLCT	28	Out	Always HIGH when the printer is powered on.
14	$\overline{\text{AFXT}}$	30	In	Not used.
31	$\overline{\text{INIT}}$	30	In	The falling edge of a negative pulse or a LOW signal on this line causes the printer to initialize. Minimum 50 μs pulse is necessary.
32	$\overline{\text{ERROR}}$	29	Out	A LOW signal indicates a printer error condition.
36	$\overline{\text{SLIN}}$	30	In	Not used.
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16,33, 19 to 30	GND	—	—	Signal ground.
15,34	NC	—	—	Not connected.

Notes: In and Out refer to the direction of signal flow from the printer's point of view. An overscore above a signal name means that the signal is active LOW.

1.3.2 Parallel Interface (Reverse Channel)

Transmission mode:	IEEE-1284 nibble mode
Synchronization:	Refer to the IEEE-1284 specification
Handshaking:	Refer to the IEEE-1284 specification
Data transmission timing:	Refer to the IEEE-1284 specification
Signal level:	IEEE-1284 level 1 device TTL-compatible level
Adaptable connector:	57-30360 (Amphenol) or equivalent
Extensibility request:	The printer responds affirmatively when the extensibility request values are 00H or 04H, which means: <ul style="list-style-type: none"> 00H: Request nibble mode reverse channel transfer. 04H: Request device ID; return data using nibble mode reverse channel transfer.

NOTE: The printer sends following device ID string when requested.

Table 1-11. Details of Device ID

00H	3CH	Contents
MGF	EPSON	Manufacturer
CMD	ESCPL2, BDC	Command system
MDL	Stylus COLOR 440 Stylus COLOR 640 Stylus COLOR 740	Model name
CLS	PRINTER	Class

- NOTES:**
1. [00H] denotes a hexadecimal value of zero.
 2. The MDL value depends on the EEPROM setting. The model name can be changed by changing an address in the EEPROM.

Table 1-12 shows pin assignments for the reverse channel. (Reverse channel is the mode in which all data is transferred from the printer to the computer.) For these signals, a twisted pair line is used, and the return side is connected to the signal GND.

Table 1-12. Pin Assignments for Reverse Channel

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	HostClk	19	In	Host clock signal.
2 to 9	Data0 to Data7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at HIGH level when data is logical 1, and at a LOW level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	PrtClk	28	Out	Printer clock signal.
11	PtrBusy, Data Bit-3,7	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckData Req, DataBit-2,6	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag, DataBit-1,5	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
31	$\overline{\text{INIT}}$	30	In	Not used.
32	$\overline{\text{DataAvail}}$, DataBit-0,4	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	In	1284 Active Signal
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5 V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16,33, 19 to 30	GND	—	—	Signal ground.
15,34	NC	—	—	Not connected.

Notes: In/Out refers to the direction of signal flow from the printer's point of view.
An overscore above a signal name means that signal is active LOW.

The following are general notes on the parallel interface:

- ❑ The Return GND Pin column in Tables 1-10 and 1-12 indicates a twisted pair return, and is used for all control signals except Logic-H, +5 V, Chassis GND, and NC. The return side is connected to GND (pins 16, 33, and 19 to 30) in the twisted pair return. Since these cables are shielded, you can reduce electrostatic noise by connecting them to Chassis GND in both the printer and computer.
- ❑ Interface conditions are based on TTL logic levels. Rise and fall times should be less than 0.2μs.
- ❑ See Figure 1-9 for the transmission timing of each signal.
- ❑ Be sure to perform data transmission only after confirming that the ACKNLG and BUSY signals are LOW.
- ❑ You can perform a print test without using external equipment. Set the 8-bit data signals (pins 20 through 27) to the appropriate word code and connect them to the ACKNLG and STROBE signals.

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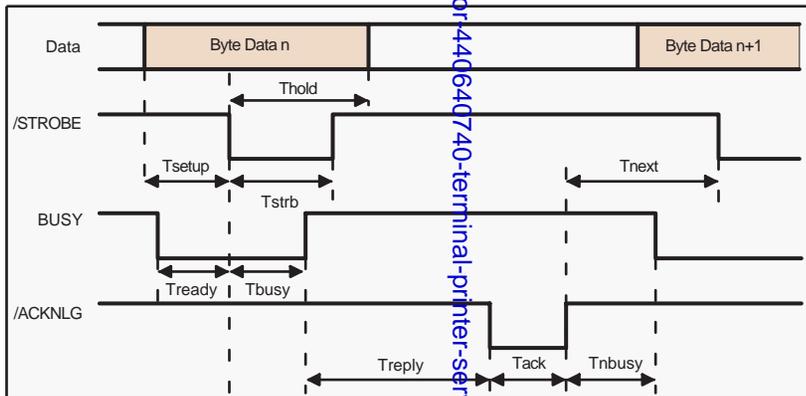


Figure 1-9. Data Transmission Timing for the Forward Channel

Table 1-13.

Maximum and Minimum Timing for Data Transmission

Parameter	Minimum	Maximum
tsetup	500ns	—
thold	500ns	—
tstb	500ns	—
tready	0	—
tbusy	—	500ns
tt-out*	—	120ns
tt-in**	—	200ns
treply	0	—
tack	500ns	10us
tnbusy	0	—
tnext	0	—

* Rise and fall time of every output signal.

** Rise and fall time of every input signal. Typical timing for the tack parameter is shown in Table 1-14 below.

Table 1-14. Typical Tack Timing

Parallel Interface Mode	Typical Tack Timing
High speed	2μs (Stylus COLOR 440 and 640)
	1μs (Stylus COLOR 740)
Normal speed	4μs (Stylus COLOR 440 and 640)
	3μs (Stylus COLOR 740)

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